

18. Explain in detail about the peptide vaccines.
19. Elaborate notes on T-cell expression cloning and its application in identifying vaccine targets for intracellular pathogens.
20. Discuss in detail the regulatory challenges of vaccines in developing countries and potential solutions.

NOVEMBER/DECEMBER 2025

23USMB43 — VACCINE TECHNOLOGY

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Explain the key milestones in the history of vaccination.
2. List out the significance of booster doses in immunization schedules.
3. List out the challenges in developing a malaria vaccine.
4. What is the mode of action of the parasitic vaccine?
5. Which adjuvant is most commonly used in recombinant vaccines?
6. Why are conjugate vaccines preferred for immunization in infants?

7. What are the key clinical requirements for rational vaccine design?
8. Define intracellular pathogens.
9. What are vaccine additives?
10. Define vaccine regulation.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Compare and contrast the roles of MHC class I and MHC class II in immune responses.

Or

- (b) Explain the requirements for the induction of an effective immunity.
12. (a) Discuss the preparation, effectiveness and limitations of rabies vaccines.

Or

- (b) Illustrate the differences between bacterial, viral, and parasitic vaccines in terms of composition and immune response.

13. (a) Explain the advantages, challenges, and future prospects of plant-based vaccines.

Or

- (b) Illustrate the importance of protein-based vaccines in immunization.
14. (a) Discuss the scope of future vaccine strategies.

Or

- (b) Explain the concept of rational vaccine design and its importance.

15. (a) Summarize the importance of quality control in vaccine manufacturing and research.

Or

- (b) Explain the Vaccine safety ethics and Legal issues.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain in detail about the active and passive immunization, including mechanisms, advantages and limitations
17. Discuss the inactivated and live poliovirus vaccines in detail.